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Recent advances in the capabilities of state-of-the-art array detectors have the potential to greatly improve analytical spectroscopy. The operational characteristics of several charge transfer device (CTD) detectors investigated in our laboratories show them to be highly suitable for application in UV-Vis molecular spectroscopy. The electro-optical characteristics of these devices including dynamic range, quantum efficiency, noise, resistance to blooming and lag are contrasted to photodiode arrays, vidicons, and photomultiplier tubes. Wtih peak quantum efficiencies of 80%, read noises over two orders of magnitude lower than photodiode array detectors, and virtually no dark current, several of these CTD detectors are extremely well suited for luminescence spectroscopy.

The performance of several spectroscopic systems which effectively use the various device geometries is presented. A linear concave grating spectrograph employing a 30-watt deuterium source and a CTD detector capable of extremely sensitive fluorescence measurements is described. Using this system, the detection limit for anthracene is $\approx 1 \times 10^{-12}$ M --

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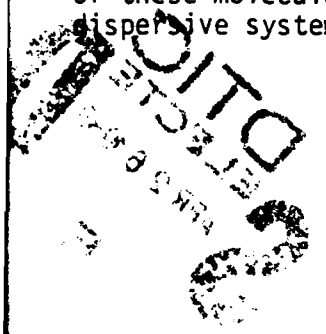

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by

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Prepared for Presentation at the
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Department of Chemistry
University of Arizona
Tucson, Arizona 85721

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MOLECULAR SPECTROSCOPY USING CHARGE TRANSFER DEVICE DETECTORS

Jonathan V. Sweedler, Patrick M. Epperson,
Rafi D. Jalkian, and M. Bonner Denton

Department of Chemistry
University of Arizona
Tucson, Arizona 85721

Index Headings: Multichannel detectors, molecular spectroscopy, fluorescence detection, luminescence detection, charge transfer devices

ABSTRACT

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